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NUTRIENT MANAGEMENT ACT, 2002

WHAT RURAL NEIGHBOURS CAN EXPECT FROM LARGE LIVESTOCK OPERATIONS

(Replaces OMAFRA Factsheet *What Rural Neighbours Can Expect from Large Livestock Operations*, Order No. 04-047)

V. Clark, J. Johnson

UNDERSTANDING TODAY'S FARMING PRACTICES

The Ontario countryside has experienced many changes in the last few decades. Although there are fewer farms, the average livestock farm size, and number of animals or poultry kept on each farm has increased. At the same time, more non-farm residents are moving to rural areas. Many of these residents are unfamiliar with the innovative methods used on today's farms.

For farmers, the land is a place of both business and residence. When businesses and residences not directly associated with farming are located in the same areas, potential land-use conflicts can occur. To ensure the best possible relationship between the farm and non-farm groups, each group needs to know what to expect from the other and respect the other's rights. New residents need to make themselves more aware of various activities on neighbouring farm operations and thereby appreciate what goes along with these normal farming practices. Farmers, in turn need to consider how some of their practices might adversely affect neighbours and make adjustments where possible. By taking the time to communicate together as shown in *Figure 1*, all rural landowners can better understand and accommodate each other's situations and needs.

Concerns from neighbours often arise where large livestock operations exist and are expanding, or where new operations are being developed. Understanding the common management practices associated with large livestock operations is an important first step toward informed communication between rural farm and non-farm groups.

FIGURE 1. A farm family and a neighbouring landowner discuss the upcoming activities to expect on the farm during planting season.

WHY LARGE LIVESTOCK FARMS ARE IMPORTANT

To remain competitive and ensure survival in a global agricultural market, farmers have had to expand the size of farm operations. The trend in the agricultural industry today is toward increased specialization and labour-saving technology, allowing farmers to care for a larger number of animals at a lower unit cost on one site. Larger barns provide labour-saving efficiencies and are designed with animal and operator comfort in mind.

Ontario livestock farms contribute to both the provincial and local economy. In 2001, livestock and livestock products accounted for half the $8.5 billion worth of Ontario's farm product sales. In addition, the agriculture industry is Ontario's second-largest employer.

A large barn provides a significant economic benefit to the local economy. Farmers commonly purchase their

supplies, such as animal feed or veterinary services, spend their family wages and often provide employment opportunities in the local community. As a result, this money circulates and strengthens the local economy.

WHY MANURE IS AN IMPORTANT RESOURCE

An integral part of a livestock farm's economy, manure is not simply a waste product to dispose of. Manure is an important source of nutrients and organic matter. When manure generated from livestock operations is spread on farmland it can add organic matter to the soil. This improves the soil's water and nutrient capacities, increasing crop yields. Also, the resulting improved soil structure reduces the potential for runoff and soil erosion, and encourages growth of beneficial organisms.

Well-managed farms, from large livestock to smaller mixed farming operations, incorporate manure best management practices (BMP's) into their operations, with some farmers obtaining all of their nutrient requirements from manure. Even though manure composition varies depending on the type of livestock or poultry it comes from, the major nutrients it supplies are nitrogen, phosphorus and potassium along with a range of other micronutrients. By applying manure onto fields, farmers can reduce their need for commercial fertilizers, cutting input costs and potentially reducing greenhouse gas emissions released during the production of commercial fertilizers.

Why and How Manure is Stored

Manure from livestock and poultry operations is generated throughout the year. However, since manure cannot always be applied to the land when it is produced, it is stored:

- to allow manure to be applied at the most practical and beneficial times for crop growth
- to apply the manure at an appropriate time to minimize any potential environmental impact.

The Ontario Ministry of Agriculture and Food's Best Management Practices recommendation is to store manure over the winter months and avoid spreading it on frozen soil.

Manure from livestock operations is commonly handled either as a liquid or solid. The type of structure used for manure storage also varies, depending on the nature of the livestock or poultry operation and manure management system. Semi-solid and liquid manure is contained in either in-ground earthen or concrete tanks, above-ground concrete or steel tanks, or in under-barn concrete storage systems. *Figure 2* shows a typical in-ground liquid manure storage tank system commonly used on dairy or swine operations. Solid manure is stored in piles, usually near the barn or in the fields where spreading is to occur. Piles are typically placed directly on the ground or on open or covered pads. Runoff control is an important component of any manure storage system.

FIGURE 2. Storage structures are used to contain liquid manure until field conditions permit application and at a time when the crop grown can best utilize the nutrients.

SITING LARGE LIVESTOCK OPERATIONS TO MINIMIZE ODOUR CONFLICTS

In rural areas, different and incompatible land uses cannot always be separated. Where there has been sufficient separation distance between differing rural land uses, there have been few conflicts.

Minimum Distance Separation (MDS) calculations are used to site livestock operations. MDS is a planning tool used to determine a recommended separation distance between a livestock facility and another land use. The objective is to prevent land use conflicts due to odour. MDS does not address noise and dust issues.

MDS I: MDS I is used to calculate a minimum separation distance for non-agricultural development from existing livestock facilities. The MDS I formula takes into account the type of livestock, the number of livestock, the land base available on the farm and the neighbouring land use.

MDS II: MDS II is used to calculate a minimum separation distance for new or expanding livestock facilities from existing or approved development. The MDS II takes into account the type of livestock, the number of livestock, degree of expansion, the type of manure produced, how it is stored and neighbouring land uses. Farmers need to consider the possibility of future growth and build in a location that will not obstruct or limit barn expansion. *Figure 3* shows separation distances that must be considered when locating buildings next to neighbouring land uses.

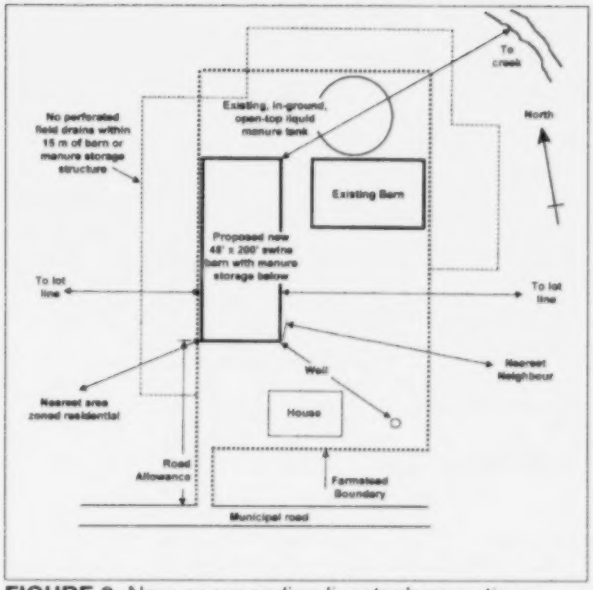

FIGURE 3. New or expanding livestock operations require the use of separation distances to reduce the potential for conflict with neighbouring land uses.

THE NUTRIENT MANAGEMENT ACT (NMA) — WHY IT IS IMPORTANT

The *Nutrient Management Act* (2002) was developed to:

- manage materials containing nutrients in ways that will enhance the protection of the natural environment, and
  provide a sustainable future for agricultural operations and rural development.

A **Nutrient Management Plan (NMP)** is a working document and management tool farmers use to identify how land applied nutrients (manure and commercial fertilizer) and existing soil fertility will be used to efficiently meet the needs of the crops grown. A NMP provides an assessment of the appropriate application rate for the field(s) and what other land application standards must be followed, while providing a level of security for the environment. Also required are plan certification agreements, and additional landowner agreements showing adequate land base for manure application if sufficient land is not owned for spreading. Plans are commonly in effect for 5 years.

A **Nutrient Management Strategy (NMS)** outlines the livestock operation and cropping system, and describes the nutrients being used and the manure storage structures and buildings. A contingency plan is included to assist in managing unexpected situations such as adverse weather, a manure spill or equipment breakdown.

For society, a NMP and NMS provide increased assurance that farmers are handling nutrients in an environmentally responsible manner. An auditing process ensures that farmers are following their NMP's or strategies.

What to Expect from Common Manure-Spreading Practices

Manure is usually applied before or early in the growth cycle of any crop. The manure application method used depends on the type, size and number of animals on the farm, the available time in the manure application season, the acreage and crop. Economics of the collection, transfer and storage system and spreading equipment also influences the choice.

Manure spreading can occur from April to December depending on the crop being grown. Commonly, spreading occurs on a field twice per year or as outlined in the NMP. Odour can vary depending on the spreading method and field and weather conditions, however, neighbours need to know this will be short-lived.

Typically, **solid manure** is applied to the soil surface. Where possible, the best management practice after spreading is to incorporate the manure into the soil as soon as possible. If the manure is being transported from storage facility to field via roads, some slight spillage can occur. Farmers are encouraged to use spreading equipment that minimizes leakage. Large amounts of spillage should not occur.

Liquid manure is commonly applied by tank spreaders or by tractor-pulled flexible hose. Manure is spread over the soil surface or injected into the soil. *Figure 4* shows manure being injected into wheat stubble. Working the manure into the soil retains more of the nitrogen in the manure and minimizes odour. Odours can occur during spreading, and its influence may be extended in windy conditions.

FIGURE 4. Injecting liquid manure into the soil reduces odour, nitrogen loss and leaves little evidence of manure on the soil surface.

Farmers should communicate with the neighbourhood and talk about what is happening on the farm. This can help neighbours better understand and deal with farm activities. For good public relations farmers need to be considerate of their neighbours, e.g. notifying neighbours when manure spreading will occur, refrain from spreading on holidays or during special community events. Likewise, neighbours need to talk to the farmer if they have concerns related to a specific farm practice. It is often associated with a management decision. All parties have to be willing to communicate with each other, and acknowledge everyone's interests.

The following best management practices demonstrate responsible manure management:

- inject or work manure into the soil soon after spreading whenever possible — to reduce odour, nitrogen loss, runoff potential
- pre-till the soil to reduce the possibility of manure reaching tile drains through fissures and worm holes, and other macro-pores
- monitor the manure application process and tile drains
- apply manure at rates that meet the nutrient needs of both crop and soil, when the land is tillable, and when the crop needs it
- avoid applying manure on soil that is wet or frozen, on sloped areas where runoff to watercourses could occur, on locations close to watercourses or areas that are flood-prone
- calibrate spreading equipment to ensure uniform manure application
- supplement soil with commercial fertilizer only as needed, to compensate for manure nutrients
- utilize fall cover crops, plant grass buffer strips along ditches and waterways to reduce potential for runoff
- consider using alternative technologies to reduce odour if applicable
- plant tree buffers as shown in *Figure 5*, or construct visual screening to improve farmstead appearances and help reduce odour and noise
- locate livestock, new buildings and manure storage as far away from neighbours as possible

FIGURE 5. A tree windbreak around livestock production facilities helps filter odours and improves the effectiveness of separation distances by creating a visual barrier to the adjacent barn.

CONSTRUCTING BARNS AND STORAGES – WHAT ENGINEERING AND INSPECTION IS REQUIRED

In Ontario, manure storage structures, including in-barn storage facilities for liquid manure, must be engineered and inspected to assure a level of protection for surface and groundwater. Facilities must be constructed in accordance with the most recent version of the *Ontario Building Code* (OBC), the *National Farm Building Code* (NFBC) and all other applicable legislation. The *NMA* requires liquid manure storage structures and in-barn storage tanks to be engineered. Engineers and building officials must ensure that all building codes are followed, structures are properly sited and proper storage capacity is available. More information on this topic can be found in the following factsheets:

- Constructing a Permanent Concrete or Steel Liquid Nutrient or Runoff Storage Facility (Order Number 06-001)
- Constructing a Permanent Solid Nutrient Storage Facility (Order Number 06-003)
- Constructing an Earthern Liquid Nutrient or Runoff Storage Facility (Order Number 06-005)

Water Use by Livestock Facilities

Agriculture accounts for about 9% of the daily amount of water used in Ontario. Of this, 15% is used by livestock facilities. (Ontario Pork 2003). Rainfall in the area immediately surrounding the barn in any given year more than compensates for the typical volume of water drawn and used by large hog or dairy operations from a typical aquifer.

Minimizing Risk to Surface and Groundwater

If barns and storage facilities are properly engineered and inspected, risk to groundwater and surface water will be minimized. Surface and groundwater is further protected through the setback distance requirements for farm buildings, manure storage facilities, wells and nutrient application.

Livestock exercise yards can be a source of surface water contamination if not properly managed. Clean water must be diverted from these yards to minimize runoff. Eavestroughing on farm buildings, concrete retaining walls or earthen diversions, and catchment areas can keep livestock runoff water from reaching surface water systems. *Figure 6* shows a well-managed livestock yard.

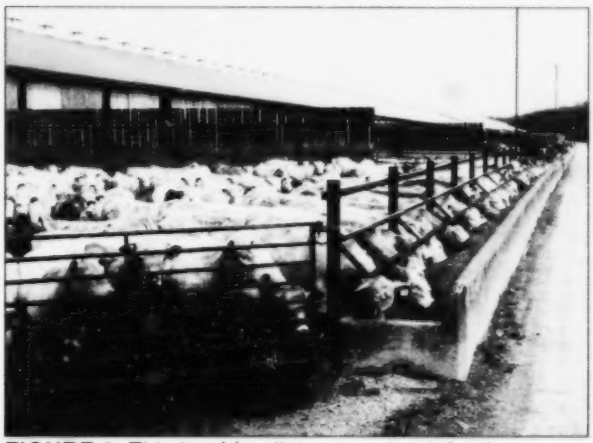

FIGURE 6. This beef feedlot uses a bunk feeder to contain the livestock runoff, ensuring it does not enter a nearby watercourse.

OTHER POTENTIAL CONCERNS BY NEIGHBOURING RESIDENTS TO LARGE LIVESTOCK BARNS

These are the most common concerns raised by local residents:

- human health issues or risk of contaminating surface or ground water
- fear of property value declining
- does it meet all local municipal by-laws
- is it considered an "acceptable" or "normal" practice
- related complaints about dust, noise of machinery, manure or other debris on the road, wandering livestock, pests, traffic congestion, use of chemicals, spray drift, animal welfare, and unsightly farmsteads.

With operations abiding by all the separation distances, the *NMA* and the other regulations in place, concerns will be minimized.

Municipalities can help reduce potential for conflicts between large livestock operators and other rural residents by initiating the following practices:

- follow accepted land use planning processes as outlined in the Guide to Agricultural Land Use
- create realistic municipal bylaws that provide for the farmer's ability to farm as well as protect the interests of the rural community.

PROTECTING THE ENVIRONMENT

The Role of Farmers

Farmers are responsible for protecting the farm's natural resources, and are partners in helping to protect public interests including property, watersheds and wildlife habitats. Their proactive adoption of BMP's and the implementation of Environmental Farm Plans on farms, has done much to identify and deal with potential environmental risks. Through the Environmental Farm Plan (EFP) program, farmers voluntarily participate in training to identify environmental strengths and concerns on their farm and develop practical plans to improve environmental conditions.

Farmers must conduct their operations in an environmentally responsible manner. They must adhere to numerous legal requirements, including the Environmental Protection Act, the Pesticides Act, the Ontario Water Resources Act, the Fisheries Act and the Nutrient Management Act.

A well maintained farmstead and reasonable consideration of the neighbour's ability to enjoy their property could have a positive effect on the community's attitude towards the farm operation.

Educational Institutions

Many university, college and farm-related institutions have comprehensive research and training programs that focus on livestock and poultry operations and their associated health and safety risks to the public. Many farmers are involved in these studies, often at their own expense. *Figure 7* illustrates the importance of on-farm odour research to study the effects of large livestock operations on odour levels.

Figure 7. Researchers involved in odour testing with large livestock operations use a scentometer to measure manure odour levels at various distances from a barn.

Government Training and Courses

Government agencies offer a range of training, as shown in *Figure 8*, some of which is mandatory for farmers. Courses provide updated information on a wide range of topics including acceptable best management practices and production techniques, environmental protection, farm management, pesticide safety and nutrient management planning. By taking courses, farmers ensure that they are operating their facility to the best of their ability and are aware of potential environmental problems and control techniques.

Figure 8. A Field Demonstration Day gives farmers hands-on experience in crop and nutrient planning.

Defining 'Normal' Farming Practices

Many concerns about livestock operations result from rural residents not fully understanding current farm practices, and what constitutes acceptable normal farming practice. OMAFRA consulted with approximately 1,000 farmers, rural landowners and municipal leaders and arrived at a definition of "normal farming practices." This definition is found in The Farming and Food Production Protection Act, May 1998 (FFPPA.) This Act was designed to protect normal farm practices to the extent that it is reasonable to do so, and is intended to ensure that farmers can carry out normal farm practices without fear of unfounded complaints or unnecessarily restrictive by-laws.

Non-farm residents must be aware of the noise, odour and dust associated with normal farm practices. The FFPPA provides an avenue for complaints to be voiced and resolved around normal farming practices. It is subject to the Environmental Protection Act, the Pesticides Act and the Ontario Water Resources Act. Additional information on the FFPPA is available at *www.omafra.gov.on.ca*.

ASSURING GOOD RELATIONS BETWEEN LIVESTOCK OPERATORS AND RURAL NON-FARM RESIDENTS

Farmers can cooperate with neighbours by:

- implementing responsible, science based farm management practices and communicating what is involved with these to the community
- being considerate of neighbour concerns
- proactively dealing with potential problems

Rural non-farm landowners can:

- become knowledgeable about what can be expected from normal farming practices
- get involved in the farming community
- recognize the positive contributions that agriculture makes to the rural landscape, the economy and society as a whole

Ontario's rural community is important to all residents of the province. Everyone has a role to play to ensure farmers and rural residents live in harmony.

This Factsheet was written by **Valerie Clark**, Regional Information Coordinator, Client Services Branch, Ontario Ministry of Agriculture,Food and Rural Affairs, London, and **John Johnson**, Engineer, Structural Design, Resources Management Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, London.

Do you know about Ontario's new Nutrient Management Act?

The provincial Nutrient Management Act (NMA) and the Regulation 267/03, as amended, regulates the storage, handling and application of nutrients that could be applied to agricultural cropland. The objective is to protect Ontario's surface and groundwater resources.

Please consult the regulation and protocols for the specific legal details. This Factsheet is not meant to provide legal advice. Consult your lawyer if you have questions about your legal obligations.

For more information on the NMA call the Nutrient Management Information Line at 1-866-242-4460, e-mail *nman@omafra.gov.on.ca* or visit www.omafra.gov.on.ca.

Factsheets are continually being updated so please ensure that you have the most recent version.

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